IE 410 – INTRODUCTION TO ROBOTICS

Lab-7 report

Creating launch file for turtlesim

Team M410:

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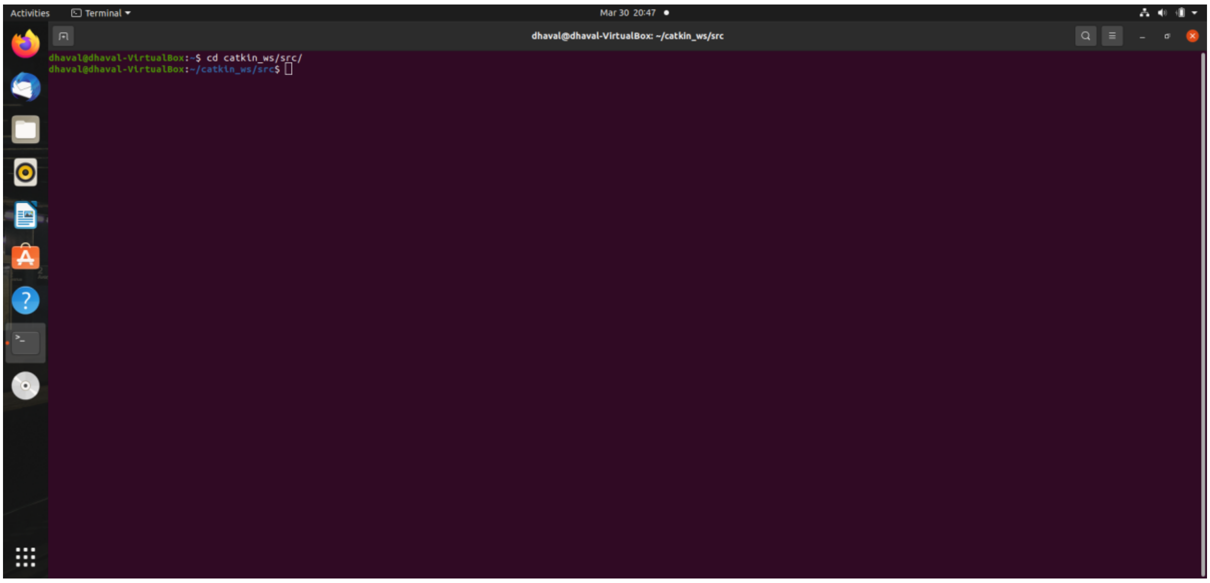
- First go to the ‘src’ folder of our catkin workspace.

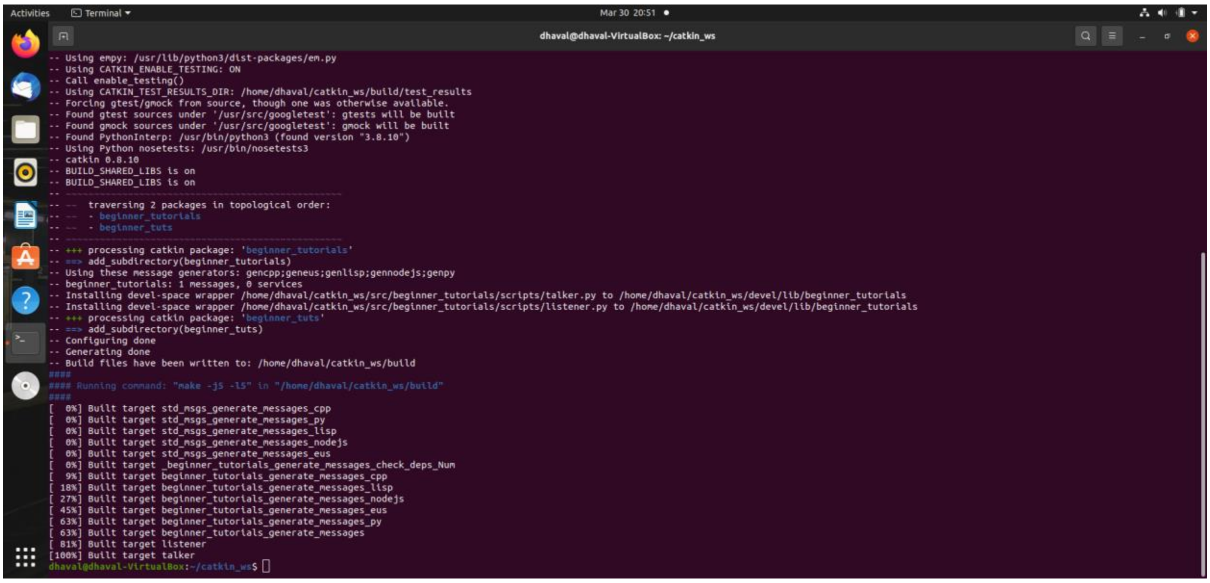
```
$ cd catkin_ws/src
```



```
dhaval@dhaval-VirtualBox:~$ cd catkin_ws/src/
dhaval@dhaval-VirtualBox:~/catkin_ws/src$ 
```

- Now use the below command to create a catkin package named beginner_tutorials.

```
$ catkin_create_pkg beginner_tutorials std_msgs rospy roscpp
```



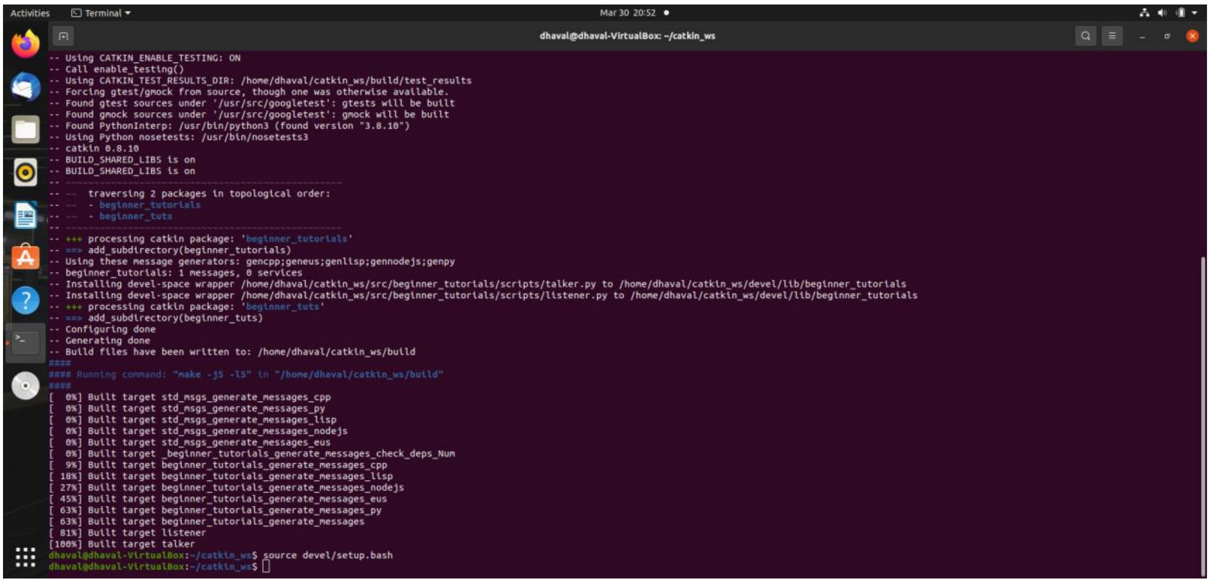
```
-- Using empy: /usr/lib/python3/dist-packages/em.py
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/dhaval/catkin_ws/build/test_results
-- Forcing gtest/gmock from source, though one was otherwise available.
-- Found gtest sources under '/usr/src/googletest': gtests will be built
-- Found gmock sources under '/usr/src/googletest': gmock will be built
-- Found PythonInterp: /usr/bin/python3 (found version "3.8.10")
-- Using Python nosetests: /usr/bin/nosetests3
-- catkin 0.8.10
-- BUILD_SHARED_LIBS is on
-- BUILD_SHARED_LIBS is on
-- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-- ~~  traversing 2 packages in topological order:
-- ~~  - beginner_tutorials
-- ~~  - beginner_tuts
-- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-- +++ processing catkin package: 'beginner_tutorials'
-- ==> add_subdirectory(beginner_tutorials)
-- Using these message generators: gencpp;geneus;genlisp;gennodejs;genpy
-- beginner_tutorials: 1 messages, 0 services
-- Installing devel-space wrapper /home/dhaval/catkin_ws/src/beginner_tutorials/scripts/talker.py to /home/dhaval/catkin_ws/devel/lib/beginner_tutorials
-- Installing devel-space wrapper /home/dhaval/catkin_ws/src/beginner_tutorials/scripts/listener.py to /home/dhaval/catkin_ws/devel/lib/beginner_tutorials
-- +++ processing catkin package: 'beginner_tuts'
-- ==> add_subdirectory(beginner_tuts)
-- Configuring done
-- Generating done
-- Build files have been written to: /home/dhaval/catkin_ws/build
####
#### Running command: "make -j5 -l5" in "/home/dhaval/catkin_ws/build"
####
[  0%] Built target std_msgs_generate_messages_cpp
[  0%] Built target std_msgs_generate_messages_py
[  0%] Built target std_msgs_generate_messages_lisp
[  0%] Built target std_msgs_generate_messages_nodejs
[  0%] Built target std_msgs_generate_messages_eus
[  0%] Built target _beginner_tutorials_generate_messages_check_deps_Num
[  9%] Built target beginner_tutorials_generate_messages_cpp
[ 18%] Built target beginner_tutorials_generate_messages_lisp
[ 27%] Built target beginner_tutorials_generate_messages_nodejs
[ 45%] Built target beginner_tutorials_generate_messages_eus
[ 63%] Built target beginner_tutorials_generate_messages_py
[ 63%] Built target beginner_tutorials_generate_messages
[ 81%] Built target listener
[100%] Built target talker
dhaval@dhaval-VirtualBox:~/catkin_ws$ 
```

- Now to build the package and workspace go to catkin_ws folder and execute catkin_make.

```
$ catking_make
```

- Now, to add the workspace to our ROS environment we need to source the generated setup file.

```
$ source devel/setup.bash
```



```
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/dhaval/catkin_ws/build/test_results
-- Forcing gtest/gmock from source, though one was otherwise available.
-- Found gtest sources under '/usr/src/googletest': gtests will be built
-- Found gmock sources under '/usr/src/googletest': gmock will be built
-- Found PythonInterp: /usr/bin/python3 (found version "3.8.10")
-- Using Python nosetests: /usr/bin/nosetests3
-- catkin 0.8.10
-- BUILD_SHARED_LIBS is on
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-- ~~  - beginner_tutorials
-- ~~  - beginner_tuts
-- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-- +++ processing catkin package: 'beginner_tutorials'
-- ==> add_subdirectory(beginner_tutorials)
-- Using these message generators: gencpp;geneus;genlisp;gennodejs;genpy
-- beginner_tutorials: 1 messages, 0 services
-- Installing devel-space wrapper /home/dhaval/catkin_ws/src/beginner_tutorials/scripts/talker.py to /home/dhaval/catkin_ws/devel/lib/beginner_tutorials
-- Installing devel-space wrapper /home/dhaval/catkin_ws/src/beginner_tutorials/scripts/listener.py to /home/dhaval/catkin_ws/devel/lib/beginner_tutorials
-- +++ processing catkin package: 'beginner_tuts'
-- ==> add_subdirectory(beginner_tuts)
-- Configuring done
-- Generating done
-- Build files have been written to: /home/dhaval/catkin_ws/build
####
#### Running command: "make -j5 -l5" in "/home/dhaval/catkin_ws/build"
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[  0%] Built target std_msgs_generate_messages_eus
[  0%] Built target _beginner_tutorials_generate_messages_check_deps_Num
[  9%] Built target beginner_tutorials_generate_messages_cpp
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[ 27%] Built target beginner_tutorials_generate_messages_nodejs
[ 45%] Built target beginner_tutorials_generate_messages_eus
[ 63%] Built target beginner_tutorials_generate_messages_py
[ 63%] Built target beginner_tutorials_generate_messages
[ 81%] Built target listener
[100%] Built target talker
dhaval@dhaval-VirtualBox:~/catkin_ws$ source devel/setup.bash
dhaval@dhaval-VirtualBox:~/catkin_ws$ 
```

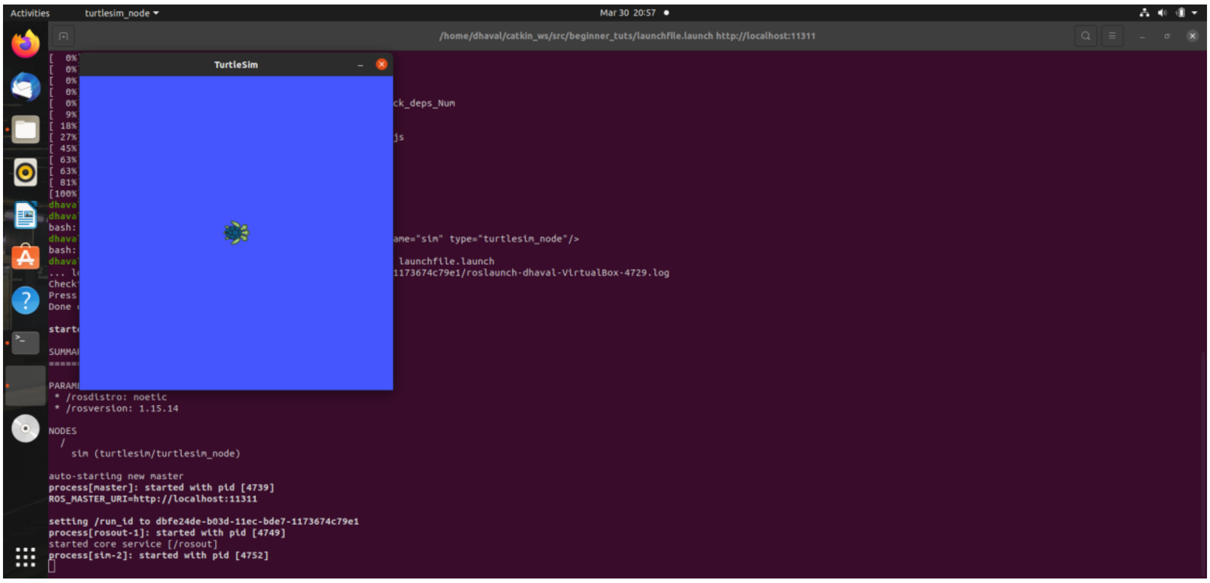
- Simple launch file

  We will write a simple launch file in our beginner_tutorials package. Content of the file is given below.

```
<launch>
    <node pkg="turtlesim" name="sim" type="turtlesim_node"/>
</launch>
```

  Now we will launch this launch file by running following command.

```
$ roslaunch beginner_tutorials launchfile.launch
```


Activities
turtlesim_node
Mar 30 20:57
/home/dhaval/catkin_ws/src/beginner_tuts/launchfile.launch http://localhost:11311
TurtleSim

```
[  0%
[  0%
[  0%
[  0%
[  0%                                              ck_deps_Num
[  9%
[ 18%                                              js
[ 27%
[ 45%
[ 63%
[ 63%
[ 81%
[100%
dhava
dhava
bash:
dhava                                              ame="sim" type="turtlesim_node"/>
bash:
dhava                                               launchfile.launch
... l                                              1173674c79e1/roslaunch-dhaval-VirtualBox-4729.log
Check
Press
Done 

start

SUMMA
=====

PARAM
 * /rosdistro: noetic
 * /rosversion: 1.15.14

NODES
  /
    sim (turtlesim/turtlesim_node)

auto-starting new master
process[master]: started with pid [4739]
ROS_MASTER_URI=http://localhost:11311

setting /run_id to dbfe24de-b03d-11ec-bde7-1173674c79e1
process[rosout-1]: started with pid [4749]
started core service [/rosout]
process[sim-2]: started with pid [4752]
```

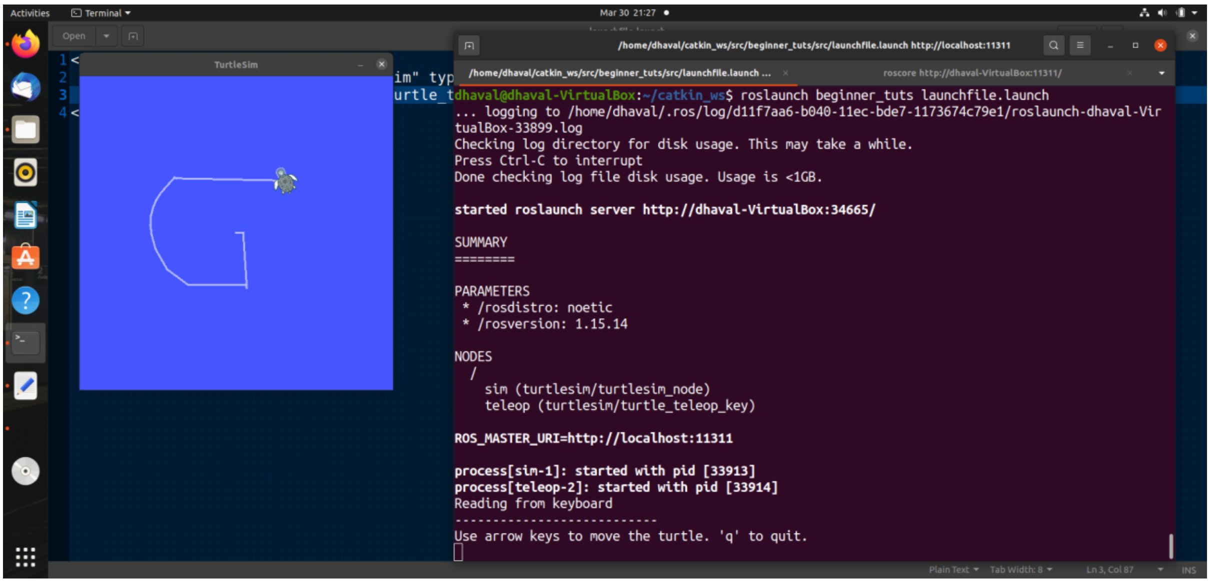
- Launch file with teleop key which can control through keyboard

  We will write a simple launch file which includes teleop key in our beginner_tutorials package. Content of the file is given below.

```
<launch>
    <node pkg="turtlesim" name="sim" type="turtlesim_node"/>
    <node pkg="turtlesim" name="teleop_key" type="turtle_teleop_key"/>
</launch>
```

  Now we will launch this launch file by running following command.

```
$ roslaunch beginner_tutorials launchfile.launch
```


Activities
Terminal
Mar 30 21:27
Open
TurtleSim
/home/dhaval/catkin_ws/src/beginner_tuts/src/launchfile.launch http://localhost:11311
/home/dhaval/catkin_ws/src/beginner_tuts/src/launchfile.launch ...
roscore http://dhaval-VirtualBox:11311/
Plain Text
Tab Width: 8
Ln 3, Col 87
INS

```
dhaval@dhaval-VirtualBox:~/catkin_ws$ roslaunch beginner_tuts launchfile.launch
... logging to /home/dhaval/.ros/log/d11f7aa6-b040-11ec-bde7-1173674c79e1/roslaunch-dhaval-Vir
tualBox-33899.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://dhaval-VirtualBox:34665/

SUMMARY
========

PARAMETERS
 * /rosdistro: noetic
 * /rosversion: 1.15.14

NODES
  /
    sim (turtlesim/turtlesim_node)
    teleop (turtlesim/turtle_teleop_key)

ROS_MASTER_URI=http://localhost:11311

process[sim-1]: started with pid [33913]
process[teleop-2]: started with pid [33914]
Reading from keyboard
---------------------------
Use arrow keys to move the turtle. 'q' to quit.
```

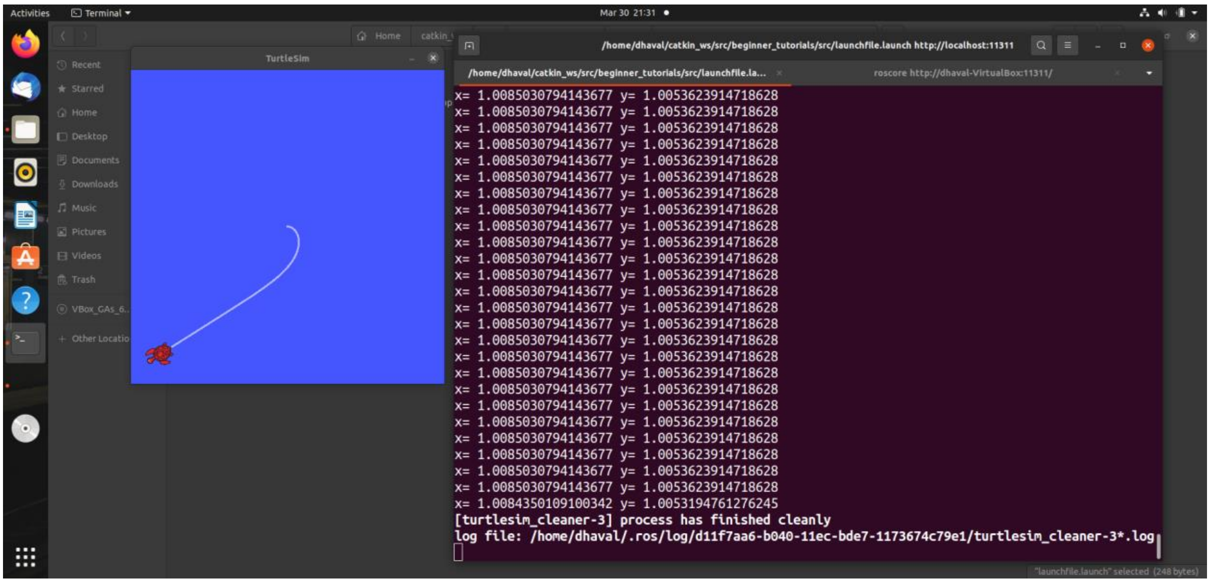
- Launch file with teleop key which can control through keyboard

  To make turtlesim node moves via python file and control through keyboard, we will write a simple launch file in our beginner_tutorials package. Content of the file is given below.

```
<launch>
    <node pkg="turtlesim" name="sim" type="turtlesim_node"/>
    <node pkg="turtlesim" name="teleop_key" type="turtle_teleop_key"/>
    <node pkg="beginner_tutorials" name="turtlesim_cleaner"
type="turtlesim_cleaner.py" output="screen"/>
</launch>
```

  Now we will launch this launch file by running following command.

```
$ roslaunch beginner_tutorials launchfile.launch
```


Activities
Terminal
Mar 30 21:31
Home
catkin_
TurtleSim
Recent
Starred
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
VBox_GAs_6...
Other Locatio
/home/dhaval/catkin_ws/src/beginner_tutorials/src/launchfile.launch http://localhost:11311
/home/dhaval/catkin_ws/src/beginner_tutorials/src/launchfile.la...
roscore http://dhaval-VirtualBox:11311/
"launchfile.launch" selected (248 bytes)

```
x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0085030794143677 y= 1.0053623914718628
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x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0085030794143677 y= 1.0053623914718628
x= 1.0084350109100342 y= 1.0053194761276245
[turtlesim_cleaner-3] process has finished cleanly
log file: /home/dhaval/.ros/log/d11f7aa6-b040-11ec-bde7-1173674c79e1/turtlesim_cleaner-3*.log
```